

# THREE NEW TYPES OF INVERTEBRATES EXTRACTED FROM MIOCENE PETROLIFEROUS NODULES

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The extraction by means of acids (formic and hydrochloric) of the ancient life concealed in the petroliferous nodules of our California volcanic mountains continues to disclose treasures which dismay our systematists.

Nodules and rocks containing petroleum have been found in close relationship to boron deposits in the Calico Mountains and Lane Mountain on the axis of the Mojave triangle; on Mt. Pinos and Mt. Frazier in Frazier Mountains at the fulcrum; in the Tehachapi Mountains and in Death Valley along the northern zone above the Garlock Fault; and Tick Canon south of the San Andreas Fault. Earlier I have discussed the significance of the petroliferous nodules (Pierce, 1962).

The peculiar processes of preservation have saved many soft-bodied creatures and plants in original 3-dimensional form, silicified or otherwise crystallized; such as moss leaves, algal tissues, larvae, pupae, and eggs, nerves, and brains, and other internal organs.

Therefore, it was no surprise that the several forms of Turbellaria which I have already described (Pierce, 1960), were preserved.

I now present preliminary studies of a nematode, and two organisms belonging to Vermes Bilateria, which do not seem to fit into the picture of any presently described group of invertebrates, one resembling the rotifers, and the other seemingly between Turbellaria and Mollusca, all three silicified and disclosing their internal anatomy. We can presume that all three lived in the detritus at the base of the algae. The nodules from which the nematode and the pseudorotifer were extracted contained no insects, but each had many fairy shrimp coprolites and plant tissues present. Mr. Gibron did not keep a record of the micro-contents of the nodule from which he extracted the pseudoturbellarian.

I present brief descriptions, illustrations and names for these curiosities, for they must have handles by which they can be further discussed, and await the verdict of specialists as to their proper position in classification.

In the Southeast Quarter of Section 23, R.1.E., T.10.N., Calico

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Mountain Quadrangle there is an unusual geological formation between Camp Rock on Mule Canon Drive and the entrance to Odessa Canon, traversed by the deep trough of Calico Fault, about 3,500 feet east of the parking lot of the town of Calico, and a little over 2,000 feet east of Odessa Canon.

A series of seven parallel ridges dip down into the fault, and crossing these in almost vertical lines are six nodule-bearing strata running east and west, over the ridges and down into the ravines.

John Gibron, Sr., who discovered this interesting nodule site, roughly measured the strata on the second ridge as 264 feet, containing six nodule zones. These six zones from south (latest) to north (oldest) are sites 118-123. Site 121 seems to be the same stratum as site 125 opposite on the ridge to the east. On September 28, 1962, there were 10 of us, each at a different nodule exposure on these ridges. Russell Gamage at site 122, collected the nodule containing the nematode specimen, No. 6178; while opposite him at site 125, I collected the nodule that contained the pseudorotifer, specimen No. 6071.

John Gibron collected in Southeast Section 24 at Dr. Palmer's site No. 19057, which is very close to the Calico Fault, and only about 5,000 feet east of the other sites, a nodule which yielded the interesting specimen No. 6086, which has many characters of the Turbellaria, but is ruled out of that group as presently interpreted.

Thus in the immediate locale of the Calico Fault, three remarkable soft-bodied creatures of Vermes Bilateria have been preserved through unusual chemical means to give us a glimpse of ancient Miocene aquatic life. I have previously reported on the Turbellaria (Pierce, 1960).

Phylum BILATERIA  
Near Class TURBELLARIA

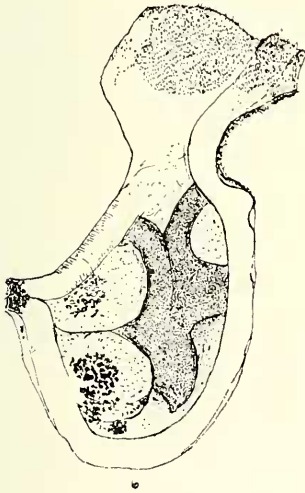
**Gibronea miocenae**, NEW GENUS AND SPECIES

Figures 1-4

The interesting worm (Specimen No. 6086) was extracted by John Gibron, using hydrochloric acid, from a nodule found at Pal-

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*Figure 1.* Specimen No. 6086, fossil worm, possibly Turbellarian, *Gibronea miocenae*, n. g., n. sp., ventral view. *Figure 2.* Stalked eye of specimen No. 6086. *Figure 3.* Mouth opening of specimen No. 6086. *Figure 4.* Simple eye of specimen No. 6086. *Figure 5.* Specimen No. 6178, fossil nematode, *Mioaphelenchus gamagei*, n. g., n. sp. *Figure 6.* Specimen No. 6071, fossil rotifer (?), *Pararotifera enigmatica*, n. g., n. sp. *Figure 7.* Specimen No. 6071, left side. All illustrations drawn by the author.



mer's government site 19057 in SE. Quarter, Section 24, just east of Mule Canon Drive and just north of the Calico Fault, at altitude 2,400 feet.

It is unusual in that there are two stalked spherical bodies, covered with lenses, which I take to be separate ocelli. And laterally on a line with the mouth are two large single eyes, in the center of which is a rod or nerve. The mouth opening is a short tube margined with retrorse spines, possibly indicating predatory or parasitic habit.

I have sketched the lateral canals, intestine, and anal area, but must leave their interpretation to experts.

The stalked and simple eyes seem to exclude from Turbellaria and Trematoda as now defined. The spiny mouth opening seems to exclude from Mollusca.

## Phylum NEMATODA

### **Mioaphelenchus gamagei**, NEW GENUS AND SPECIES

#### Figure 5

Specimen No. 6178 placed in phylum Nematoda, tentatively in Class Phasmidia, Order Rhabditida, Suborder Tylenchina, Family Aphelelenchidae.

On September 28, 1962, at the same time I was collecting specimen No. 6071, at site 125, Russell Gamage, opposite me on the next ridge at site 122 picked up nodule No. 30949, which weighed 17.8 grams and measured 36.5 x 28.5 x 17.5 mm. From this I extracted by use of formic acid, a perfect crystallized nematode, specimen No. 6178, measuring 4.16 mm. in length and 0.32 mm. in width, which I place under a new generic name, **Mioaphelenchus**, next to *Metaaphelenchus* for the tail is bluntly rounded. The specimen is so transparent in the anterior portion that it can only be seen by manipulation of the light.

The head end is only slightly narrower than the rest of the body, but is anteriorly blunt, with a blunt stylet. The esophagus is short extending only half way to a very distinct nerve ring.

The body is filled with coils and tubes, and there are numerous pigmented bodies as indicated by the drawing. In the posterior quarter the excretory canal is distinct, terminating in a pigmented spot at a corner of the bluntly rounded apex.

## Near Class ROTIFERA

**Pararotifera enigmatica**, NEW GENUS AND SPECIES

## Figures 6 &amp; 7

In the sludge from formic acid extraction of a smooth, unlayered, pale colored Miocene nodule, No. 30908, slightly oval in form, weighing 9.8 grams, and measuring 24 x 20.5 x 13.5 mm., which I collected, September 28, 1962, at site 125, in lot 421, close to 2,400 feet altitude in the Southwest Quarter of Section 23, R.1.E., T.10.N., Calico Mountains, I found this strange little crystallized body, specimen No. 6071. It measures 1.076 mm. in length, and 0.576 mm. in greatest width.

The same nodule contained many fairy shrimp (Anostraca) coprolites, and one complete crystallized mammal hair, but no plant tissues. There was a little color (petroleum) in the specimen when first extracted.

The drawing shows a broad duct arising on the head, and passing down the front and around and up to an anal opening where it is joined by a similar duct that must be connected with the first in the neck area, and margins the dorsum to the anus. There are no visible organs in the head, but beyond the neck the body is filled with ducts and organs. I will not attempt to name these parts. The head is covered with tiny particles which obscure anything inside.

## LITERATURE CITED

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